Agency Update
DMACE Challenge

December 14, 2010

UCSB Team Advances Digital Manufacturing, Wins DARPA Challenge
$50,000 Prize awarded in DARPA DMACE Challenge

A team from the University of California, Santa Barbara has successfully modeled correlations in digital manufacturing processing (DM) that may lead to advances in manufacturing and cut costs for the Department of Defense. The effort was part of DARPA's Digital Manufacturing Analysis, Correlation and Estimation (DMACE) Challenge. The DARPA DMACE Challenge was a program developed and managed by DARPA's Service Chiefs' Fellows, a team of seven military officers and one government civilian representing all four military services.

Competitors were challenged to develop models that predicted the maximum compressive load that could be supported by digitally manufactured titanium spheres and polymer cubes. A wide variety of mathematical and engineering methods were used to develop predictive models with the goal of advancing knowledge of the potential capabilities and limitations of DM processes. The UCSB team created accurate models to predict the output properties of both structures created by DM processes.

Leo Christodoulou, director, DARPA Defense Sciences Office, stated that "DARPA and its Service Chiefs' Fellows also established a significant repository of open-source data for digital manufacturing. This collection of open-source data, if expanded, has the potential for accelerating the understanding of DM processes with regard to their output products and may enable processes leading to the certification and approval of DM components for use in military systems."

"The span of modeling approaches taken by the contestants, from purely data driven to physics based approaches, has served to illustrate the range of viable methods available to predict the properties of DM manufactured components," explained Gill Pratt, program manager, DARPA Defense Sciences Office.

The UCSB Team won the challenge using finite element models for both structures and will be awarded the $50,000 Prize for the DMACE Challenge. The UCSB team was led by Professor Frank Zok, and included Professor Matt Begley as well as PhD students Nell Gamble and Chris Hammetter.

DARPA would like to extend its gratitude to Naval Post Graduate School in Monterey, California and Oak Ridge National Laboratory in Oak Ridge, Tennessee for their support during the challenge.

DMACE Challenge information can be found on website at www.DMACE.net.

For additional information, contact DARPA Public Affairs, DARPAPublicAffairsOffice@darpa.mil
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